

REMARKS

Claims 16-56 were pending when last examined. All pending claims are shown in the detailed listing above.

Claim Rejections – 35 USC § 102

Claims 16-56 stand rejected under 35 U.S.C. § 102(e) as being anticipated by Chang (USPN 6,621,235). Applicants respectfully traverse.

Claim 16 recites “a plurality of current regulators, each current regulator connected to a respective LED and operable to regulate the current provided to the respective LED” and “a detector coupled to the plurality of current regulators, the detector operable to detect an occurrence of current starvation at any of the current regulators, the detector further operable to output a signal for adjusting power supplied to the charge pump in response to the detection of an occurrence of current starvation.” Contrary to the Examiner’s assertions, these limitations are not disclosed or taught by Chang.

The Examiner suggests that the elements referred to by reference numerals Q11-Q1N are “a separate current regulator ... for each of its LED’s.” Applicants respectfully disagree. Chang discloses a *single* linear regulator 15 for driving N LED strings 28₁, 28₂, ... 28_N. See Chang, col. 3, lines 2-6; FIGS. 2 and 3. This *single* linear regulator controls Q11-Q1N, which are MOSFETs. As such, Chang does not disclose or teach “a plurality of current regulators, each current regulator connected to a respective LED and operable to regulate the current provided to the respective LED” as recited in Applicants’ Claim 1.

Nor does Chang disclose or teach “a detector coupled to the plurality of current regulators, the detector operable to detect an occurrence of current starvation at any of the current regulators, the detector further operable to output a signal for adjusting power supplied to the charge pump in response to the detection of an occurrence of current

starvation” as also recited in Applicants’ Claim 1. Nowhere in Chang is there any mention of current starvation, much less a detector for detecting an occurrence of current starvation.

For at least the reasons discussed above, Applicants respectfully request that the rejection of Claim 16 under 35 U.S.C. § 102(e) be withdrawn and this claim be allowed. Furthermore, because Claims 17-25 depend from Claim 16 and include further limitations, the Applicants respectfully request that the rejection of these claims under 35 U.S.C. § 102(e) also be withdrawn and that Claims 17-25 be allowed.

Claim 26 recites “regulating the current provided to each LED with a respective current regulator; detecting an occurrence of current starvation at any of the current regulators; and adjusting power supplied to the charge pump in response to the detection of an occurrence of current starvation.” These limitations are not disclosed or taught by Chang.

As previously discussed, Chang discloses only a *single* regulator, not a plurality of regulators such that there would be “regulating the current provided to each LED with a respective current regulator” as recited in Claim 26. Furthermore, nowhere in Chang is there any mention of current starvation, and accordingly, Chang does not have any “detecting an occurrence of current starvation at any of the current regulators; and adjusting power supplied to the charge pump in response to the detection of an occurrence of current starvation” as also recited in Claim 26.

For at least the reasons discussed above, Applicants respectfully request that the rejection of Claim 26 under 35 U.S.C. § 102(e) be withdrawn and this claim be allowed. Furthermore, because Claims 27-28 depend from Claim 26 and include further limitations, the Applicants respectfully request that the rejection of these claims under 35 U.S.C. § 102(e) also be withdrawn and that Claims 27-28 be allowed.

Claim 29 recites “a plurality of current regulators, each current regulator operable to control current in a respective one of the LEDs; and a detector operable to detect a condition

of current starvation at any of the current regulators.” These limitations are not disclosed or taught by Chang, for all of the reasons previously discussed.

Accordingly, Applicants respectfully request that the rejection of Claim 29 under 35 U.S.C. § 102(e) be withdrawn and this claim be allowed. Furthermore, because Claims 30-33 depend from Claim 29 and include further limitations, the Applicants respectfully request that the rejection of these claims under 35 U.S.C. § 102(e) also be withdrawn and that Claims 30-33 be allowed.

Claim 34 recites “a plurality of current regulators, each current regulator connected to a respective LED and operable to regulate the current provided to the respective LED so that, collectively, the plurality of LEDs are uniformly illuminated.” Such limitation is not disclosed or taught by Chang, for all of the reasons previously discussed.

Claim 34 also recites “a detector coupled to the plurality of LEDs, the detector operable to detect an undervoltage condition at any of the LEDs, the detector further operable to output a signal for adjusting power supplied to the charge pump in response to the detection of the undervoltage condition.” Nowhere in Chang is there disclosed or taught any undervoltage condition, or detection of the same.

Accordingly, for at least the reasons discussed above, Applicants respectfully request that the rejection of Claim 34 under 35 U.S.C. § 102(e) be withdrawn and this claim be allowed. Furthermore, because Claims 35-40 depend from Claim 34 and include further limitations, the Applicants respectfully request that the rejection of these claims under 35 U.S.C. § 102(e) also be withdrawn and that Claims 35-40 be allowed.

Claim 41 recites, “detecting an undervoltage condition at any of the LEDs; and adjusting power supplied to the charge pump in response to the detection of the undervoltage condition.” These limitations are not disclosed or taught by Chang, for all of the reasons previously discussed.

Accordingly, Applicants respectfully request that the rejection of Claim 41 under 35 U.S.C. § 102(e) be withdrawn and this claim be allowed. Furthermore, because Claims 42-43 depend from Claim 41 and include further limitations, the Applicants respectfully request that the rejection of these claims under 35 U.S.C. § 102(e) also be withdrawn and that Claims 42-43 be allowed.

Claim 44 recites “a detector for detecting if a supply voltage for the system is diminishing and for adjusting the gain ratio of the multi-mode charge pump in response to the detection of a diminishing supply voltage; and a plurality of current regulators, each current regulator coupled to one of the plurality of LEDs for individually adjusting the power supplied to the respective LED.” These limitations are not disclosed or taught by Chang.

For at least the reasons discussed above, Applicants respectfully request that the rejection of Claim 44 under 35 U.S.C. § 102(e) be withdrawn and this claim be allowed. Furthermore, because Claim 45 depends from Claim 44 and includes further limitations, the Applicants respectfully request that the rejection of this claim under 35 U.S.C. § 102(e) also be withdrawn and that Claim 45 be allowed.

Claim 46 recites “regulating current in each of the LEDs to not exceed a desired amount; detecting a condition of current starvation in any of the LEDs; and regulating a voltage supplied to the plurality of LEDs in response to the detecting so that the current starvation is abated.” These limitations are not disclosed or taught by Chang.

For at least the reasons discussed above, Applicants respectfully request that the rejection of Claim 46 under 35 U.S.C. § 102(e) be withdrawn and this claim be allowed. Furthermore, because Claims 47-48 depend from Claim 46 and include further limitations, the Applicants respectfully request that the rejection of these claims under 35 U.S.C. § 102(e) also be withdrawn and that Claims 47-48 be allowed.

Claim 49 recites “means for regulating current in each of the LEDs to not exceed a desired amount; means for detecting a condition of current starvation in any of the LEDs;

and means for regulating a voltage supplied to the plurality of LEDs in response to the detecting so that the current starvation is abated.” Chang does not disclose or teach these limitations.

For at least the reasons discussed above, Applicants respectfully request that the rejection of Claim 49 under 35 U.S.C. § 102(e) be withdrawn and this claim be allowed. Furthermore, because Claims 50-51 depend from Claim 49 and include further limitations, the Applicants respectfully request that the rejection of these claims under 35 U.S.C. § 102(e) also be withdrawn and that Claims 50-51 be allowed.

Claim 52 recites “a plurality of diodes, each diode connected to a respective LED at a respective sense terminal, wherein the plurality of diodes operate collectively to provide a signal derived from a lowest of voltage values appearing at the sense terminals; and an operational amplifier operable to receive the signal provided by the plurality of diodes, the operational amplifier operable to generate a feedback signal for controlling the power supplied to the plurality of LEDs so that the voltage values appearing at the sense terminals are held at an appropriate level.” These limitations are not disclosed or taught by Chang.

For at least the reasons discussed above, Applicants respectfully request that the rejection of Claim 52 under 35 U.S.C. § 102(e) be withdrawn and this claim be allowed. Furthermore, because Claims 53-55 depend from Claim 52 and include further limitations, the Applicants respectfully request that the rejection of these claims under 35 U.S.C. § 102(e) also be withdrawn and that Claims 53-55 be allowed.

Claim 56 recites “regulating the current in each of the LEDs to not exceed a respective predetermined amount so that the LEDs are uniformly illuminated; detecting if any one of the LEDs is receiving insufficient current; and in response to the detection of insufficient current, adjusting the voltage supplied to the LEDs so that no LED is receiving insufficient current.” Chang does not disclose or teach these limitations.

For at least the reasons discussed above, Applicants respectfully request that the rejection of Claim 56 under 35 U.S.C. § 102(e) be withdrawn and this claim be allowed.

CONCLUSION

Applicants respectfully request that the pending claims be allowed and the case passed to issue. Should the Examiner wish to discuss the Application, it is requested that the Examiner contact the undersigned at (415) 772-7428.

Certificate of Mailing

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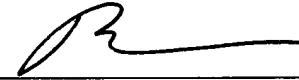
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October 7, 2005

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